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GEOGRAPHICAL RECORD

NORTH AMERICA

Selling U. S. Topographic Sheets. An innovation by the Post Office Department at Washington is likely to increase the distribution of our topographic sheets. Most of these maps have heretofore been sold to the public from Washington. Now, however, postmasters in towns and villages have permission to handle the maps. When the Geological Survey prints a new map it sends a sample copy to postmasters in the area covered with the suggestion that they exhibit it and order a small stock to sell to those who wish the map. Postmasters receive a small commission on their sales. Many postmasters are now handling the maps, and an increasing number are sold in this way.

The State Geographical Society of New Mexico. This society was organized in October, as the *Bulletin* is informed by the *University of New Mexico Weekly* (Oct. 19). David Ross Boyd, Ph.D., President of the University, was elected President, Governor McDonald, Senator Catron, Ex-Governor Prince and Professor C. T. Kirk, Vice-Presidents, and R. J. Palen, Treasurer. These officers, with six other gentlemen who were appointed, will form the Geographical Board which will direct the work of the society. The chief function of the society will be to recommend nomenclature for various historical places and landmarks, to gather new data on various places in the state of historic interest and to work for the preservation of the old Spanish and Indian names. The society will endeavor to throw new light on many historic facts and localities of which most of the people of the state are ignorant. For example, while California has made her missions known to the world, New Mexico's missions have scarcely been mentioned by writers on the state though many of them were old or decayed before those of California were founded.

Further Surveys of the Kuskokwim River, Alaska. The survey parties of the Coast and Geodetic Survey in Alaska have closed work for the season and returned to Seattle. The steamer *Yukon*, R. R. Lukens commanding, continued the survey of the Kuskokwim River, the channel into which was charted during the previous season, opening up a vast region in the interior of Alaska (*Bull. Amer. Geogr. Soc.*, Vol. 47, 1915, pp. 205-206). The work was extended to the head of deep water navigation at Bethel, 155 miles above the mouth of river. No shifting of channels or changes of depths were noticed. The mud flats along Eek Channel appear unchanged from the previous season, contradicting the theory that these channels change every year when the ice goes out. The steamer *Alliance*, piloted by H. A. Cotton of the Coast and Geodetic Survey, carried a greater draft (17 feet) to Bethel than had been carried before by any vessel.

Several other vessels of the Survey spent the season in various bays and rivers, charting channels and searching for hidden obstructions to navigation, a number of which were discovered.

Large Development in the Juneau Gold District. An examination of mining developments in the Juneau region, Alaska, was made last year by Henry M. Eakin, of the United States Geological Survey, whose report has been published as *Bulletin 622-C*. The developments near Juneau overshadow in magnitude the operations in other parts of the gold belt. Gold lode mining in this field, already developed on a scale that places the Juneau district in line with the foremost in the industry, is rapidly assuming still greater proportions. The growth is a natural result of a fuller knowledge of the size and character of the ore bodies and of the economic possibilities of operations on a large scale.

The climatic conditions are favorable to continuous operation. The large size of some of the ore bodies, the character of the ores, and the strong topo-

graphic relief of the region favor the production of large quantities of ore with a minimum of labor and power. Water power, marine transportation, and a sufficient local supply of timber and lumber reduce general expenses to a low point. The very small cost of operation makes it possible to work profitably low-grade ores that under conditions only slightly different would be valueless (*U. S. Geol. Survey Press Bulletin*).

Florida Canals. The east coast of Florida now has a chain of natural protected thoroughfares along the greater part of its length, navigable by vessels of light draft. Connecting canals, constructed by a corporation operating under state charter, are of insufficient dimensions, and a Florida association is urging Federal acquisition and improvement. In the southern portion of the state a series of canals is under construction by a state commission with the object of draining the Everglades, creating a great area of cultivable land as well as providing free passage across the state between the Atlantic and Gulf coasts. Furthermore, the state possesses a magnificent natural waterway in the St. Johns River, leading from the port of Jacksonville far into the interior of the fruit-growing district, and it is anticipated that this river may be connected at some point with the Gulf intracoastal survey in order to form one of the links in the intracoastal chain from Florida to New Orleans.

The engineers' report on the Atlantic intracoastal survey, within the limits of Florida, says that a seven-foot depth is already authorized or under construction between Charleston, S. C., and Jacksonville, Fla. Boats of eight-foot draft, under existing projects, will soon be able to ascend the St. Johns River 170 miles to Sanford on Lake Monroe, which is very near the Everglades basin where the state projects are under way. Along the east coast of Florida, between the St. Johns River and Key West, channels now exist that offer a four-foot draft, and further improvement by the Federal government is not recommended under present conditions. The engineers anticipate that an improved route between the St. Johns River and the Gulf, when constructed, will proceed across the state and not around it ("The Atlantic Intra-Coastal Waterway," published by the Atlantic Deeper Waterways Assoc., Philadelphia, 1915, p. 3).

The Record of the United States in Geography, 1889-1913. Mr. Henry G. Bryant of Philadelphia read a paper at the meeting of the International Geographical Congress at Rome in 1913, giving a résumé of exploration and other geographical achievements by governmental agencies and citizens of the United States for the 24 years ending in 1913. It appears in the *Proceedings* of the Congress issued last year and embraces 40 pages of condensed information. The paper deals with the geographical work of the Geological Survey, the Coast and Geodetic Survey and other governmental agencies, of the various geographical societies and of Americans in foreign countries and in the Arctic.

Work of the Blue Hill Meteorological Observatory. It is a great satisfaction to be able to record the continued activity of Blue Hill Observatory, long known throughout the scientific world because of the many important contributions which the late Professor A. Lawrence Rotch and other members of his staff made to meteorology during the first quarter-century of that observatory's existence. The work goes on, thanks to the endowment left by Professor Rotch, and thanks also to the splendid generosity of Mrs. Rotch, who is making possible, by her interest and her support, the continued activity of Blue Hill Observatory on a scale worthy of the founder's ideal. Meteorology owes Mrs. Rotch a debt which it fully realizes and is glad to acknowledge.

Under Professor Alexander McAdie, the new Director, the work at Blue Hill is going forward, successfully, actively, and with the high standards that have distinguished its past. A recent publication (*Observations and Investigations made at the Blue Hill Meteorological Observatory, Massachusetts, U. S. A., in the years 1911, 1912, 1913, and 1914, under the direction of Alexander McAdie, Annals Astron. Observatory of Harvard College, Vol. 73, Part 2, pp. 95-177, Cambridge, Mass., 1915*) contains the observations made at the three ground stations and in the free air at Blue Hill during 1911-1914, a short statement on

the advance of the seasons based on the records for 1886-1914, and a discussion of temperature inversions as related to frost, by Professor McAdie. The summaries now give, for the first time, temperatures in degrees absolute, and pressures in kilobars.
R. DEC. WARD.

The Hottest Region in the United States. Mr. G. H. Willson, District Forecaster of the Weather Bureau at San Francisco, under the title "The Hottest Region in the United States" has recently discussed the meteorological record kept at Greenland Ranch, on the edge of Death Valley, Cal., from the spring of 1911 to May, 1915 (*Monthly Weather Rev.*, June, 1915, pp. 278-280). The station is conducted by arrangement between the Weather Bureau and the Pacific Coast Borax Company. The most interesting single observation is that of a maximum of 134°, on July 10, 1913, which seems to be the highest yet recorded at any definitely established station. Temperatures of 120° or more have been recorded in May, June, July and August. The mean of the monthly maximum temperatures has exceeded 100° from May to September every year with one exception, when the record was 95.4°. The maximum temperature has reached or exceeded 100° on 548 days in the four years of the record. A condensed temperature table is included in the paper, which will have an interest for those who are looking for somewhat sensational temperature data for this country.
R. DEC. WARD.

Rainfall of the United States. Mr. B. C. Wallis, who has already published studies of the rainfall of the northeastern and the eastern United States (*Monthly Weather Rev.*, Jan., 1915, pp. 11-14 and 14-24, respectively), continues his investigation in a paper on the rainfall of the western United States (*ibid.*, April, 1915, pp. 170-175). Twelve monthly charts of *equipluves* are given, as well as diagrams of rainfall intensities and charts showing the driest months, wettest months and rainfall regions in the western United States. The author concludes that the rainfall of this country as a whole is determined by (1) continental influences, exerted over a broad triangle with the vertex to the south and with the edge of the Rocky Mountains as the eastern side; (2) oceanic influences exerted over the coastal lowlands, on the west from the Pacific and on the east from the Atlantic; (3) intermediate regions, viz., the Rockies and the western Appalachians; and (4) direct solar influences, along the southern boundary as far west as Yuma, Ariz.

In another paper, on "The Rainfall Régime of the Several States" (*ibid.*, April, 1915, pp. 176-178), Mr. Wallis gives a chart showing the approximate grouping of the states as rainfall sections. This is based upon the data from which the *equipluves* considered in the previous paper were constructed. The great areas of single summer maximum over the northern Plains and stretching east to the Lakes, the Pacific coast single winter maximum, the northern Basin and Plateau district, with its primary maximum in winter and secondary maximum in May, are all clearly shown.
R. DEC. WARD.

Area of Heaviest Snowfall in the United States. Our heaviest snowfall occurs in the high Sierra Nevada of California, especially along the line of the Southern Pacific Railway which connects Sacramento and Reno. This snowfall is discussed by Andrew H. Palmer in a recent paper (*Monthly Weather Rev.*, May, 1915, pp. 217-221). Over a considerable area more than 100 inches of snow falls every winter. The average seasonal snowfall for 44 years was 419.6 inches at Summit (7,017 feet) and 521.3 inches for 8 years at Tamarack (8,000 feet). In the winter of 1879-80, 783 inches of snow fell at Summit. As is well known, the measurement of snowfall presents many difficulties. The Marvin shielded gauges have been found by the Weather Bureau most satisfactory for new snow, but there is a growing demand in California for a simple and practicable method of measuring deep snow, on the ground. The heavy snowfalls at and near Summit are not accompanied by high winds, as on our Eastern mountains, at Mt. Washington, N. H., for example. Railroad operation in this district shows many direct responses to the heavy snowfall, as all travelers over the Southern Pacific route, through Summit, well know. The famous "thirty miles of snowsheds" cost on an average \$150,000

a year for upkeep and renewals. The danger of fire is so great that fire-fighting trains are kept always in readiness, summer and winter. In connection with this discussion, reference may be made to the snowfall chart of Dr. C. F. Brooks (*Quart. Journ. Roy. Meteorol. Soc.*, Vol. 39, April, 1913), in which a small area in the Cascade Mountains, close to the Canadian border, is shown to have a mean annual depth of snow of over 400 inches. R. DEC. WARD.

The Weather and the Potato Crop. The relation between weather conditions and the yield of various crops in the United States has been studied, in recent years, by several investigators. Professor J. Warren Smith, of the U. S. Weather Bureau, has given attention to the effect of weather upon the yield of potatoes (*Monthly Weather Rev.*, May, 1915, pp. 222-236). While the study is confessedly not complete, it supplies some advance in our knowledge of the subject. Numerous charts illustrate the average dates of planting, digging, number of days between planting and digging, temperatures at dates of planting, rainfall during growing period, thermal constants, sunshine, etc. The planting and digging of early potatoes naturally progresses from south to north, but in the case of late potatoes from north to south. The mean daily temperature, on the date when the planting of early potatoes begins, is close to 45° Fahr., except in the extreme southern portion of the country, near the Gulf. The best yield of potatoes is not where the greatest amount of rain falls, and the daily amount of heat necessary for the potato crop is greatest in the central districts, where the rainfall is greatest. More detailed study of the Ohio potato crop shows a marked relation between the mean July temperature and the potato yield, and also shows that the rainfall is not so important a controlling factor as temperature. R. DEC. WARD.

The Wood and the Plains Buffalo. The wood buffalo, according to G. A. Mulloy (*Ann. Rept. Dept. Interior Canada for year ending March 31, 1914*, Vol. 2, Part 6, pp. 108-112), is now found chiefly in the extreme northern part of Alberta, west of the Slave River, between the Peace River and Great Slave Lake. The animals are scattered all over this region in small bands or singly. The temperature in winter may fall far below zero but the air is dry, the snow is not deep enough to cover feed beyond reach, and the animals take shelter, in very severe weather, behind a timber-covered bluff or in some slough surrounded by bush. Mr. Mulloy says the wood buffalo do not now number over 500 to 550 head. They are likely, however, to hold their own and gradually increase, as the Indians are forbidden to kill them and the Northwest Mounted Police enforce this prohibition. Strays from a herd may be killed by wolves but buffalo in a band are not afraid of these animals. Mr. Mulloy believes that the wood buffalo is considerably larger than the buffalo that formerly wandered over our western plains. Some of the bulls are enormous in height and weight, and the skulls of dead animals seem to indicate larger development than that of the plains buffalo.

In Buffalo Park, Wainwright, southeastern Alberta, some 400 miles south of the southern limit of the wood buffalo's present range, there were 1,453 plains buffalo in 1914, an increase of 234 head over the preceding year (*Ann. Rept. Dept. Interior Canada for year ending March 31, 1914*, Vol. 1, Part 5, pp. 55-58). There are also herds of the plains buffalo in the Dominion at Banff and Lamont, Alberta. Thus the efforts of both the United States and Canadian governments, and other agencies, will probably prevent the extinction of this animal, which, a few years ago, seemed impending.

CENTRAL AMERICA AND WEST INDIES

Geological Survey of Panama. It was announced last year that an investigation of the geology of Panama was to be made under the joint auspices of the Isthmian Canal Commission, the U. S. Geological Survey and the Smithsonian Institution. This work is now in progress. The *Annual Report of the Smithsonian Institution for 1914* (p. 12) says that the general plan includes a systematic study of the physiography, stratigraphy and structural

geology, geological history, geological correlation, mineral resources (including coal, oil and other fields), petrography and paleontology of the Canal Zone and of as much of the adjacent areas of the isthmian region as is feasible. When the work is completed, the Institution will print a general account of the results, and later a detailed report of the geological data of the isthmus and adjoining regions will be published.

SOUTH AMERICA

The Development of Rosario, Argentina. With a phenomenal growth of population and trade Rosario ranks as the second city of Argentina. In 1851 the population was only 3,000; in 1900, 112,000 and in 1913 over 233,000. Immigration has been the chief factor of increase; over 45 per cent. of the present inhabitants are foreign-born. Commercial progress has been still more remarkable. Rosario is now the first port for the shipment of maize and linseed and second only to Buenos Aires for wheat and oats. Its rivalry with the latter port may be said to date from the commencement of harbor construction in 1902: the commercial movement has increased from 1,000,000 tons in that year to 4,250,000 tons in 1913. Situated on a great river and at the convergence of seven railroads in the greatest cereal-producing province of the country, Rosario has a wide sphere of economic influence. Her distributing ground extends from Mendoza and the foot-hills of the Andes to the Paraná watershed of Entre Ríos and Corrientes and even into Bolivian territory. (*Diplomatic and Consular Reports, Annual Series No. 5458*, London, 1915.)

Climate of Quito. Many writers have described the climate of Quito as "perpetual spring." This it is, in some respects, being much like early May in parts of central Europe. Quito's mean temperature, its variable weather, with frequent afternoon rains and even hail in the rainy season, its fairly large periodic diurnal temperature ranges—these are more or less similar to Europe's spring. But there are many points of difference, and Quito has climatic characteristics which are far from "perfect." The contrast between its burning afternoon sunshine and its cool nocturnal hours is so great as to be keenly felt. Its explosive rains are chilling. Under clouds, or during rains by day, and during the hours when the sun is below the horizon, the sense of chill is universal and is uncomfortable. Most Europeans suffer from the cold. The lack of proper heating facilities in the houses adds to the discomfort. Warm clothing is essential, and the traditional tropical outfit is inappropriate, as well as uncomfortable. Thus, there are two sides to the picture of Quito's climate. The interest in the subject is stimulated by the contrast, and by the widely varying opinions which have been expressed upon it. The latest discussion of this matter is contained in one of Professor J. von Hann's important series of papers dealing with the meteorology of the equator (III: "Meteorologie des Hochtales von Quito," *Sitzungsber. Kgl. Akad. Wiss. Wien., math.-naturwiss. Klasse*, Vol. 124, Nos. 1 and 2, 1915). R. DEC. WARD.

Argentine Weather. Mr. H. Helm Clayton, formerly of the Blue Hill Observatory (Mass.) and now of the Argentine Meteorological Office, is making a special study of forecasting in Argentina. A paper entitled "A Study of the Moving Waves of Weather in South America," by Mr. Clayton, was recently read before the Royal Meteorological Society of London (*Quart. Journ. Roy. Meteorol. Soc.*, Vol. 41, 1915, pp. 201-207). The author notes that the charts showing the weather conditions over the South American continent indicate permanent centers of high pressure at about 30° S. latitude. These high-pressure systems oscillate slowly back and forth over limited areas, and there is a series of low-pressure systems passing from west to east immediately south of the continent, viz., in about 60° S. latitude. An examination of the charts of daily pressure and temperature changes seems to show that these changes are in the nature of waves, which, appearing first in the extreme south of South America, progress northward or northeastward. Diminishing in intensity, they die out or disappear near the equator. It is evident that these waves of changing pressure do not follow the movements of centers of high and

low pressure, but are independent phenomena causing changes in the distribution of pressure and in the shapes of the isobars, and in this way giving rise to changes of wind and weather. In order to raise forecasting from an art to a science, Mr. Clayton believes it is essential to replace mental estimates by quantitative measurements of expected changes, and to make quantitative forecasts. He has applied this principle to the Argentine weather map for April 20, 1910, and gives the map of pressure predicted in this way for April 21, together with the map of the observed pressures. There is a marked similarity in the trend of the isobars in the two maps. The daily temperatures at 8 A. M. were plotted for four stations for May and June, 1910, and these revealed two classes of waves, taking about three and six days respectively to pass from Punta Arenas to Rio de Janeiro.

R. DEC. WARD.

AFRICA

A Steel Steamer on Lake Tanganyika. On February 1 last year, the railroad across German East Africa from Daressalam on the Indian Ocean to Kigoma, the port of Ujiji, on Lake Tanganyika was completed. It is 777 miles long and is the eastern section of the line of steam communication, partly by rail and partly by water, across tropical Africa from sea to sea. The *Bulletin* (June, p. 449) announced that the steam route across the continent had been practically completed, as the Belgians had joined the Congo with the west coast of Tanganyika by rail. A map there published shows the entire route.

The *Deutsches Kolonialblatt* (Aug. 1, 1915) prints a photograph of the *Götzen*, the first to be built of the three steamers that are intended to ply on Lake Tanganyika, connecting the German railroad from the Indian Ocean with the Belgian railroad and Congo transportation system to the Atlantic. The *Götzen* was built at Papenburg on the Ems before the war. She is 219 feet long, has a steel hull, twin propellers, cabins, dining and smoking rooms both for first and second class passengers, and large freight capacity. She was taken to pieces for shipment to Africa and pieced together as she was carried over the railroad from Daressalam to Lake Tanganyika. The railroad was of course an essential factor, for without it the material could not have been transported to the central lakes region.

While the great war has waged, skilled artisans have been assembling the pieces. There has been fighting between the British and Germans eastward toward the Indian Ocean, but the work of the ship-builders at Tanganyika has gone steadily on. The steamer was built when the material development of Africa was making mighty strides and launched last summer when African enterprise was dead; but when better times come, such ships on Lake Tanganyika will probably have all they can do, for they will complete the last link in this system of transcontinental transportation across tropical Africa. The building of the *Rechenberg*, one of the sister ships of the *Götzen*, was also completed, but she is still in Germany.

ASIA

Anthropological Research in Eastern Asia and the Peopling of America. For the extension of researches in eastern Asia, in continuation of anthropological investigations carried on in Siberia and Mongolia under the direction of the Smithsonian Institution in 1912, an allotment has been made for work during the next fiscal year and for a limited period thereafter. The plan of operations includes a thorough study of the peoples of the eastern coast of Asia, Manchuria, Mongolia, Tibet, and Siberia, among whom it is believed lies the secret of origin of the American Indian. Investigations thus far made by Dr. Hrdlička in behalf of the institution indicate, he says, "that there exist to-day over large parts of eastern Siberia and in Mongolia, Tibet, and other regions in that part of the world numerous remains which now form constituent parts of more modern tribes or nations, of a more ancient population (related in origin, perhaps, with the latest paleolithic European), which

were physically identical with, and in all probability gave rise to, the American Indian" (*Ann. Rept., Smithsonian Inst. 1914*, p. 17).

Dr. Hrdlička also has a paper in the *Journal of Heredity* (Vol. 6, No. 2, pp. 79-91) in which he refers to the long-disputed question of the origin of the American Indian. In the light of our present knowledge there is no accepted evidence nor any probability that man originated on this continent—a conclusion of great interest on account of Ameghino's curious contentions as to the origin of the Amerind in Argentina and foreshadowed by Hrdlička's recent book "Early Man in South America" (*Bur. Amer. Ethnol. Bull. 52*, Washington, 1912). Man did not reach America until after attaining a development superior to that of late Pleistocene man in Europe and after undergoing advanced and thorough stem, racial and tribal differentiation.

American natives, barring the more distantly related Eskimo, present throughout the western hemisphere many important features in common which mark them plainly as parts of one stem of humanity. Dr. Hrdlička describes the characteristic physical features of the American Indian and finds that they more closely resemble those of the great stem of the human race which, embracing several separate types and many nationalities, occupies the eastern half of the Asiatic continent and a large part of Polynesia. Circumstances point strongly to an emigration, not strictly a migration, from northeastern Asia after the glacial period, of relatively small parties, and to the peopling of America by local multiplication of more thus introduced; and these migrations were probably repeated nearly to the beginning of the historic period.

Carl Lumholtz in the East Indies. A letter received by Councilor James B. Ford from Carl Lumholtz, dated Batavia, Java, August 6, 1915, said that his plans for leaving Borneo with a party, about the middle of 1914, for exploration in Dutch New Guinea along the Digul River and among the interior islands (*Bulletin*, Vol. 46, 1914, pp. 442-443) had been defeated on account of the war. He was about ready to start when the Governor-General informed him that he could not fulfill his promise to provide facilities until after the war. The explorer then visited India, where he spent seven months, chiefly at Benares. When he wrote, he was preparing for an expedition to central Borneo, the government supplying him with a photographer, two men to collect the zoological specimens and a small escort of soldiers. His destination was the mountainous region between the two northwestern tributaries of the Barito River, which empties into the Java Sea at the city of Banjarmasin. He expected to start on August 14 and to return to Batavia in February or March next, when he hopes to be able to set out on his New Guinea explorations.

Return of an Anthropological Expedition from Siberia. In June last year the Oxford University School of Anthropology and the Philadelphia University Museum sent an expedition to the northern coast of Siberia to make studies and collections among the natives. The party included Miss M. A. Czaplicka, leader, Miss Curtis, artist, Miss Haviland, ornithologist, and Mr. Hull of Philadelphia, ethnologist. The party descended the Yenisei River to its mouth. The first tribe visited was the Samoyeds, and the winter was spent among the Tungus of the tundra, a very primitive race little influenced by Russian culture. The spring was devoted to the Tatars, who are much more civilized than either the Samoyeds or Tungus. Much information of scientific interest was acquired and a large collection of costumes, weapons, implements and ornaments of copper and iron was made. It is expected to exhibit the collection in Europe and America after the war (*Nature*, Sept. 16, 1915).

EUROPE

Aërological Work in Holland. During the year 1914, under the auspices of the Meteorological Institute of the Netherlands, free air data were obtained by means of kites, pilot balloons, captive balloons and *ballons-sondes* carrying self-recording instruments. The mean altitudes reached averaged higher than in the preceding year. Some of the difficulties met with in carry-

ing on work of this character in Holland are suggested by the note that the balloons several times fell into the Zuyder Zee. The effect of the war is seen in the fact that the materials necessary for balloon construction were very hard to secure. The mean maximum altitude of visibility of the pilot balloons was over 4,000 meters, which is a good record for a climate like that of Holland. The greatest altitude was over 12 kilometers. The results of all the ascents have been published in full, in tabular form, but unfortunately there is no discussion of the data (*Ergebnisse Aerologischer Beobachtungen*, K. Nederlandsch. Meteorol. Inst., Utrecht, 1915). R. DEC. WARD.

In Honor of Captain Cook. In commemoration of Captain Cook a tablet has been placed on the school at Great Ayton, Cleveland, Yorkshire, where the navigator received his education; a scholarship has also been established at Marton, in the same neighborhood, which was Captain Cook's birthplace. The cost of both has been provided out of the surplus of the fund raised for the erection of the Cook memorial in London (*Nature*, Sept. 9, 1915, p. 47).

POLAR

The Norwegian Whaling Industry in 1913. The Norwegian whaling industry reports improved circumstances for 1913 (*Diplomatic and Consular Reports, Annual Series No. 5464*, Sept., 1915). The output of oil and guano was increased, being valued at about £2,000,000, and the creation of a mutual insurance association and other coöperative institutions among the companies helped to place the industry on a more satisfactory basis. The northern grounds, from the Shetlands and Iceland to Spitzbergen, yielded an insignificant fraction of the production, only 19,122 barrels of oil out of a total of 595,000. A period of rest is required before the restocking of the waters will again render the industry remunerative. In the southern grounds, the South Georgia and South Shetland areas each afforded over 200,000 barrels of oil, derived mainly from the larger, or blue, and the fin whales. The humpback whale, the important catch of previous years, is diminishing in numbers. The improved returns from the south are a result of increased efficiency in the outfit, both in boats and in oil-reducing machinery. The number of land stations has been increased, and in Norway itself two new companies have erected works for the refining of all kinds of fish oil, especially whale, seal and herring oils.

ARCTIC

Return of the Sverdrup and Vilkitski Expeditions. The daily press announced in October that both the Sverdrup and Vilkitski expeditions had returned safely to Europe. The two parties in their three ships reached Archangel in the middle of September. Commander Sverdrup left Christiania on July 15, 1914, at the request of the Russian government, with the object of seeking for traces of the Russian expeditions under Brusiloff and Rusanoff which had been lost in the Polar regions (*Bulletin*, Jan., 1915, pp. 53-54; April, 1915, p. 287). Sverdrup wintered in the western portion of the Taimyr Peninsula and engaged in exploration work during the winter of 1914-1915 but found no traces of the missing Russians. Commander Vilkitski has been successful in making the continuous voyage from Vladivostok to Archangel along the north coast of Siberia and this without the loss of any member of his crew. He is the second to make the Northeast Passage, Baron Nordenskjöld having been the first to accomplish this journey, along the northern coast of Asia, in 1878-1879. No details are as yet available with regard to these notable voyages of Sverdrup and Vilkitski.

Position of the North Magnetic Pole. In a letter to the editor of *Terrestrial Magnetism and Atmospheric Electricity* (June, 1915, p. 75) the late Dr. Aksel S. Steen, under whose direction the magnetic observations made by Amundsen on his Northwest Passage expedition were being worked out, says that it will not be possible to give a definite position for the north magnetic

pole, because the pole, in his opinion, is not a point lying in a certain latitude and longitude, but must be defined as that point of the earth's surface where the horizontal intensity at the moment is zero. It is probable that Amundsen's observations will show that the point so defined has a mean daily and yearly periodic motion and, besides, also more or less irregular displacements. Perhaps it will be possible to find a mean position of the pole or the form and dimensions of a closed curve within which the pole always is to be found.

PHYSICAL GEOGRAPHY

An Argument Against Glacial Erosion. Professor Romer of the University of Lemberg has studied glacially sculptured forms for many years, especially in the High Tatra district of the Carpathians and in the Swiss Alps. In his discussion (*Kosmos*, Vol. 34, 1909, pp. 239-262), he comes to the conclusion that the essential features of scenery are due to the work of running water, but that there is some modification by the glacial ice. The paper is written in Polish, but has a summary in German.

He interprets as evidence to support his conclusion (a) the position of the present glacier tongue of the Mer de Glace outside the great trough of the Rhone valley, (b) the lack of stony material in glaciated valleys, as near the Rhone Glacier, and (c) the scarcity of ground moraine on surfaces laid bare by glacier retreat in contrast to the strong development of lateral moraines.

In the Carpathians, Romer believes the forms ascribed by others to glacial erosion are best explained by subglacial water erosion, as near the headwaters of the River Theiss. In that valley Romer describes the well-developed stream channels which carry hardly any water at the present time. Their borders touch both rims of the glacial trough and, in Romer's opinion, unless the valley has been developed under the glacier the valley walls would show clear evidence of having been notably modified by post-glacial erosion and sapping. He believes that subglacial waters deepen valley troughs and that the ice merely polishes and planes off the ledges. Romer acknowledges that glacial erosion does produce cirques and the lake basins at the headwaters of mountain streams. He recognizes that glaciers also change the direction of streams, that they do an enormous work of transportation, and that they protect and preserve valley forms produced by stream erosion. Lastly he recalls the great steps in the longitudinal profiles of main valleys in whose formation he is satisfied that stream erosion may be excluded. Romer does not understand exactly how they were formed by glacial erosion, however, and brings up the possibility of "epirogenic rejuvenation," presumably faulting or warping, for these steps. The fatal weaknesses of this theory were established by Davis in a classic essay, entitled "Sculpture of Mountains by Glaciers," in the *Scottish Geographical Magazine* for February, 1906.

As a whole the paper seems to take a position midway between that of those who deny glacial erosion absolutely and those who accept it for some phenomena, but not for all.

LAWRENCE MARTIN.

METEOROLOGY AND CLIMATOLOGY

Sunspots and Temperature. In connection with his study of the correlation in seasonal variations of weather, Dr. Gilbert T. Walker, Director-General of Indian Observatories, has recently published a monograph on "Sunspots and Temperature" (*Mem. Indian Met. Dept.*, Vol. 21, Pt. 11, 1915). The subject is one to which much attention has already been paid. Köppen's pioneer work in this connection is well known. Recently an important publication by J. Mielke (*Archiv der Deutschen Seewarte*, Vol. 36, No. 3, 1913), which is in some respects a continuation of Köppen's earlier work, stimulated Köppen to renew his own investigation (*Met. Zeitsch.*, Vol. 31, 1914). The latter have already been reviewed in the *Bulletin* (Vol. 47, 1915, pp. 184-189). Dr. Walker has given his results as correlation coefficients, not as curves of sunspots and temperature. He has plotted the correlation co-

efficients on an outline map of the world to the nearest .05. Areas of positive coefficients are shaded, but are to be regarded as "rough and preliminary." It is suggested that the fall in temperature in tropical regions at times of maximum sunspots may be explained if the increase in wind, due to increased solar radiation, were to bring enough increase of cloud, humidity and rainfall over the lands to lower their temperatures. This might be true for the ground level, but up aloft the air should be warmer. If this be a correct explanation, tropical and semi-tropical places, where a rise, or at least a diminished fall, of temperature might be looked for, would be in large deserts, beyond the reach of inflowing damp air, and possibly over islands, where the air is always so damp that no increase in humidity would markedly effect the temperature. A new feature which comes out in Dr. Walker's work is the tendency towards higher temperatures in the Eurasian polar regions at times of sunspot maxima.

R. DEC. WARD.

General Circulation of the Atmosphere. Professor W. H. Hobbs, in a recent paper ("The Role of the Glacial Anticyclone in the Air Circulation of the Globe," *Proc. Amer. Philos. Soc.*, No. 218, Vol. 54, 1915, pp. 185-225), has made a noteworthy contribution to the theory of the general circulation of the atmosphere. With the large supply of new material from the various polar expeditions he substantiates his theory of the glacial anticyclone, propounded first several years ago. The old circumpolar-whirl idea needs considerable revision to bring it into accord with the observed facts of air circulation in the polar regions. The determining factor in this circulation is the location of the great continental glaciers; latitude is only indirectly concerned. Many features of the winds, character of the snow, and temperature changes indicate that fixed anticyclones exist over the Antarctic and Greenland ice domes.

Most significant is the centrifugal flow of the surface air currents above the inland ice masses, a flow prevailing down slope, though deviated by the earth's rotation. Wind and slope observations indicate that both the Greenland and Antarctic ice sheets have more than one ice center and anticyclone. The winds on the central flat regions are generally light and variable, but increase in velocity towards the margins, where they attain great violence. The more or less constant outward sweep of the winds carries much of the inland snow into the sea. Mawson reports, "For months the drifting snow never ceased." Even with relatively high temperatures the snow in the air remains powdery in structure, indicating its drifting character.

The upper currents stream towards the anticyclonic centers, carrying with them cirriform clouds, which apparently evaporate in the down-flowing air near the center. The moisture from these clouds is evidently the source of the inland snow. Furthermore, the air in the central regions has been described both in Antarctica and Greenland as exceedingly damp. The precipitation of this moisture normally occurs in the form of ice needles near the surface without the intermediate formation of clouds.

The temperature of the lower air closely depends on that of the ice. During periods of calm the rapid radiation of heat to the ice cools the atmosphere to a considerable height. Under the influence of gravity this cold air tends to flow down the slopes, giving rise to the blizzards of the margins. With the downward acceleration of the wind the rate of adiabatic warming increases and ultimately exceeds the rate of cooling by radiation. This warming automatically stops the blizzard, and another calm period sets in during which the cold air again accumulates. Such is the apparent mechanism of much of the weather on the margins of Greenland and Antarctica.

The great strength of these permanent anticyclones is obvious from the rarity (if ever) with which any cyclone passes over Greenland and by the extension of the southerly winds to a distance of 200 miles seaward from the ice margin of Wilkes Land. Associated with the anticyclones are the permanent cyclones southeast, south and west of Greenland and in the Weddell and perhaps the Ross Seas. Thus it is evident that the general circulation of the atmosphere in high latitudes is complex and is determined primarily by the location of ice domes and the neighboring open seas.

CHARLES F. BROOKS.

HISTORICAL GEOGRAPHY

Blaeu's World Map of 1605. This map, one of Blaeu's earliest and most important works, has recently been reprinted by the Hispanic Society of America as No. 85 in the series of its publications. The reproduction is one of many undertaken by Dr. E. L. Stevenson and is an excellent facsimile of the unique copy belonging to the Hispanic Society. The map is particularly interesting by reason of its age and the character and fullness of its records. As a source of geographical knowledge of its time, its value is perhaps unsurpassed by any other map. It is printed on eighteen sheets of a fine grade of Van Gelder hand-made paper and is accompanied by an explanatory text which contains a partial list of the great Dutch cartographer's productions. Our Society's facsimile of this map has been suitably framed and now hangs in the Exhibition Hall.

GENERAL

Major Lyons' Address at the Meeting of the British Association.

In the course of his Presidential address before the Geographical Section of the British Association at the Manchester meeting this year, Major H. G. Lyons said that to see what advance has been made in the scientific study of geography in Great Britain in the past twenty-five years, study must be given to the results attained by geographical investigators who have made detailed studies of various phenomena and particular regions. "If we do so I think we must admit that the number of original investigators in scientific geography who are extending its scope in this way is not so large as it might be, nor are we yet utilizing sufficiently all the material which is available to us. Any one who will examine the geographical material which has been published will find that purely descriptive treatment still far outweighs the analytical treatment which alone can lead to definite advances in scientific geography. If pleasing descriptions of this or that locality are sought for, they are for the most part to be found readily in the very large amount of such material that has been and is being published each year by residents, travelers, and explorers; but if information is desired in the prosecution of a piece of geographical research, we are checked by the lack of precise details. Few of this class of descriptions are sufficiently definite to enable the necessary comparisons to be made between one locality and others which are similarly situated; thoroughly quantitative treatment is for the most part lacking, and while a pleasing picture is drawn which is probably true in character, it is usually inadequately furnished with those definite facts which the geographer requires."

Major Lyons said that in every part of the British Isles a geographer may find some geographical problem which is well worth working out and which, if thoroughly done, will be a valuable contribution to his science. He deplored the common neglect of mathematical geography. While in national surveys the determination of positions is carried on to great refinement in order to supply the necessary control for the construction of large-scale maps, most inadequate attention is usually given to the location of travelers' routes. Some important and costly expeditions have presented their results, in so far as they relate to routes followed and the position of points determined, in such a way that it is impossible to say within what precision such positions have been determined; consequently any combination of these results with those of later expeditions has to be carried out empirically.

Major Lyons expressed the opinion that the paucity of papers dealing with practical cartography and the compilation of maps is proof that this branch of the subject needs more serious attention than it now receives. He advised that technical papers of a thoroughly scientific character should be presented to small meetings of other workers in the same or allied fields where they might be completely criticized. The reading, discussion and publication of such papers are for geographers a great desideratum, for it is in them and by them that all new advance in the subject is made. He inquires if the exposition of a regional study impresses sufficiently upon the student the necessity of personal research in the details of a problem in such a way as to gain a real working acquaintance with it.

Major Lyons' paper is so admirable in the originality and good judgment it displays that few objections can be raised against it. But a goodly number of geographers will hardly have his attitude towards regional studies and exploration. It is quite true, as Major Lyons contends, that there is a great quantity of unorganized material but the organization requires something more than office research. Modern geography, with its strong human element, was not generally recognized as a science until a few years ago. Much of the field work before that time resulted in reports and monographs deficient in essential facts and principles. It follows that the modern geographer not uncommonly secures more reliable material in a year of field work than he could gather in five years of work on the uncritical, formless observations of untrained observers. Nor must we overlook the formative effect upon the mind of scientific observations in new fields. The profound influence which exploration may exert upon young men is well illustrated in the classic examples of Darwin and Dana. Had they waited for the complete mastery of the known principles of their time both would have lost, not only in that power of analysis, but also in that power of discovery of new principles which to a high degree are outgrowths of the search for truth through the medium of first-hand observation.

PERSONAL

Dr. J. Scott Keltie, late Secretary of the Royal Geographical Society, has received the gold medal of the Scottish Geographical Society in recognition of his services to geographical science.

The Livingstone gold medal of the Scottish Geographical Society has been awarded to Lord Kitchener for his work on the survey of Palestine and as director of the survey of Cyprus as well as for his services to the state.

Joseph Bradfield Thoburn, who has had charge of the ethnological work at the University of Oklahoma, is on leave of absence preparing a history of the state.

OBITUARY

Professor FREDERICK WARD PUTNAM, the distinguished anthropologist and naturalist, died on August 14 in his seventy-seventh year. He was honorary curator of the Peabody Museum at Harvard University. His untiring energy was for many years devoted not only to ethnological research but also to the Museum's development.